THE MINERAL INDUSTRY OF MOZAMBIQUE

By Thomas R. Yager

In 2003, the mineral industry of Mozambique produced aluminum, gold, tantalum, and such industrial minerals as bauxite, bentonite and other clays, gemstones, graphite, and salt. The country also produced coal, natural gas, and such building materials as cement, granite, gravel, limestone, marble, and sand. Deposits of asbestos, copper, diatomite, feldspar, fluorspar, gypsum, iron ore, manganese, mica, nepheline syenite, perlite, phosphate rock, rare earths, silica sand, and titanium are also known to occur.

The International Monetary Fund (2004c, p. 206) estimated that Mozambique's gross domestic product (GDP) grew by 7.1% in 2003, compared with 7.4% in 2002, and 13% in 2001. In 2002, construction accounted for 15.9% of the GDP; manufacturing, 13.4%; electricity and water, 3.1%; and mining, 0.3%. GDP at purchasing power parity amounted to $22.2 billion in 2003 (International Monetary Fund, 2004b, p. 5; 2004§[1]).

Output in the mining sector increased by 32% in 2003 compared with 52% in 2002. Increased production of bauxite, beryl, gold, limestone, and tantalite more than offset decreases in coal and granite production. In 2003, the manufacturing sector grew by 15% as a result of the expansion of the Mozal aluminum smelter (Mozal 2 project). With the completion of this project and the Mozambique Natural Gas Project, however, output in the construction sector fell by nearly 8%. In the electricity/water utility sectors, output declined by nearly 13% (International Monetary Fund, 2004a, p. 33, 38-41).

Legislation

A new mining law went into effect at the end of 2002. Under the new legislation, artisanal and small-scale miners are exempted from paying royalties and surface taxes and the registration process for artisanal miners is simplified. The lifetime of reconnaissance and exploration licenses is increased. The new legislation also provides guarantees to owners of mining concessions and allows small-scale and artisanal miners to be given exclusive rights on a specific zone (Africa Mining Intelligence, 2002).

Commodity Review

Metals

Aluminum.—Mozambique was Africa's second largest producer of aluminum behind South Africa. The Mozal aluminum smelter, which used alumina imported from western Australia as raw material, increased output to 407,400 metric tons (t) in 2003 compared with 273,200 t in 2002 and 266,000 t in 2001 (table 1). Mozal was jointly owned by BHP Billiton plc (47.11%), Mitsubishi Corporation (25%), Industrial Development Corporation of South Africa Ltd. (IDC) (24.04%), and the Government of Mozambique (3.85%). Production increased because of the completion of the Mozal 2 project in April 2003, which doubled Mozal's rated capacity to 506,000 metric tons per year (t/yr). The smelter reached full capacity in the third quarter of 2003 (Mining Journal, 2003).

Mozal's aluminum was exported to Europe utilizing the duty-free status of Mozambican goods. Exports of aluminum rose to $519 million in 2003 compared with $361 million in 2002. In 2003, aluminum accounted for 58% of Mozambique's total exports. From 1999 to 2003, aluminum accounted for 86% of the total growth in the country's exports (World Bank, 2003, p. 7; 2004, p. 97).

The Government of Mozambique planned to develop a downstream aluminum industry. In 2003, the Government was negotiating with investors to fund aluminum-manufacturing facilities (Metal Bulletin, 2003c).

E.C. Meikles (Pty.) Ltd. of Zimbabwe operated a small bauxite mine in Manica Province. In 2003, output increased to 11,793 t compared with 9,119 t in 2002 and 7,883 t in 1999. All of Mozambique's bauxite production was exported in 2003 at a value of $849,000 (Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

Gold.—Mozambique's gold resources were located in lode and placer deposits throughout the country; gold was produced by artisanal miners. Officially reported production of gold increased to 63 kilograms (kg) in 2003 compared with 17 kg in 2002 and 19 kg in 1999. In 2003, production increased in Manica, Nampula, Tete, and Zambezia Provinces. Mozambique's entire reported gold production was exported in 2003 at a value of $623,000 (International Monetary Fund, 2004a, p. 39; Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

African Eagle Resources plc of the United Kingdom planned to conduct geochemical soil sampling and ground magnetic surveys at its Majele gold project in 2004. The company planned to conduct drilling if the results of the sampling and survey programs were favorable (African Eagle Resources plc, 2004, p. 5).

Nickel.—African Eagle Resources held a prospecting license for the Muazua nickel project. African Eagle planned to carry out geologic and geochemical surveys at Muazua in 2004, followed by pitting and trenching (African Eagle Resources plc, 2004, p. 5).

Iron and Steel.—The state-owned Cia Siderurgica Mocambicana (CSM) held a rolling mill in Maputo. In 2003, Barnes Fencing Industries signed an agreement with CSM to manage the plant for 10 years. Barnes planned to produce 60,000 to 120,000 t/yr of

[1] References that include a section mark (§) are found in the Internet References Cited section.

sections and wire rod using billet imported from Ukraine and Zimbabwe; production was expected to start in March 2004 (Metal Bulletin, 2003a).

Tantalum.— National production of tantalite increased to 188,695 kg in 2003 from 46,900 kg in 2002; tantalite exports amounted to 165,493 kg at a value of nearly $4.14 million. Rising production was partially attributable to the reopening of the Marropino Mine in April 2003. Fleming Family & Partners (FF&P) reopened Marropino at a cost of $10 million; the company planned to produce about 90,000 kilograms per year of tantalite. Hegemony Resources operated the Naquissupa open pit tantalite mine, which was located in the Gilé District of the Zambezia Province (Metal Bulletin, 2003b; Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

Titanium and Zirconium.—The Corridor Sands Project was based upon 10 deposits of heavy-mineral sands near Chibuto in southern Mozambique. WMC Resources Ltd. of Australia held a 90% interest in the project; the Industrial Development Corporation of South Africa held the remaining 10%.

WMC planned to start construction at Corridor Sands in 2005 and to begin production in mid-2007. The company hoped to produce 375,000 t/yr of titanium slag, 184,300 t/yr of high-purity pig iron, 21,500 t/yr of zircon, 5,100 t/yr of rutile, and 2,700 t/yr of leucoxene in the initial phase of the project. By 2017, WMC planned to produce 1 million metric tons per year (Mt/yr) of titanium slag, 491,100 t/yr of high-purity pig iron, 62,500 t/yr of zircon, 12,200 t/yr of rutile, and 6,400 t/yr of leucoxene. The initial phase of the project was expected to cost $500 million, and the expansion to full production, $300 million (Mining Review Africa, 2003; WMC Resources Ltd., 2003).

Kenmare Resources plc of Ireland held a mining license for the Moma mineral sands. The company planned to start production in late 2005 and to produce 640,000 t/yr of ilmenite, 49,000 t/yr of zircon, and 14,000 t/yr of rutile. Moma's projected lifetime was at least 20 years. In March 2003, the Government issued the mining license for the Moma project. By the end of July, Kenmare had signed contracts for the purchase of 100% of the zircon and rutile production and more than 50% of the ilmenite production (Kenmare Resources plc, 2003a, p. 2-4, 7; b-d; Tassell, 2003).

Industrial Minerals

Cement.—Cimentos de Portugal, SGPS, SA (Cimpor) held a 65.4% stake in Cimentos de Mocambique SARL, which was the country's only cement producer. In 2003, Cimpor increased the combined capacity of the Dondo, Matola, and Nacala plants to 760,000 t/yr compared with 730,000 t/yr in 2002. Cimpor's production rose by 27% in 2003 in spite of such problems as haphazard railway service to transport limestone (Cimentos de Portugal, SGPS, SA, 2004; p. 74).

National consumption of cement was estimated to have increased to 675,000 t in 2003 from 575,000 t in 2002 and 313,000 t in 1998. Cimpor's share of the domestic market rose to 88% in 2003 compared with nearly 85% in 2002. Nearly one-half of domestic cement demand was met through imports (Cimentos de Portugal, SGPS, SA, 2001, p. 78; 2004, p. 74).

Clay and Shale (Bentonite and Other Clays).—Mozambique had deposits of bentonite, brick clay, and kaolin. Brick clay production rose to 100,176 t in 2003 compared with 84,024 t in 2002. Cia Desenvolvimento Mineira continued to mine bentonite at Boane in southern Mozambique. Production of crude bentonite ceased because of flooding at the mine site, but small amounts of bentonite were still processed from stockpiles. Exports of processed bentonite rose to 444 t in 2003 compared with 214 t in 2002 (International Monetary Fund, 2004a, p. 39; Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

Gemstones.—The mine output of garnet fell to 440 kg in 2003 compared with 1,136 kg in 2002 and 1,447 kg in 1998. Production fell in 2003 because of rains that shut down production at the Cuamba Mine during February, March, and April. The production of dumortierite and tourmaline rose (table 1). In 2003, reported exports of aquamarine, dumortierite, garnet, and tourmaline amounted to less than $100,000 (International Monetary Fund, 2004a, p. 39; Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

Graphite.—The Ancuabe graphite mine in Cabo Delgado Province remained on care-and-maintenance status in 2003 because of high production costs and low world-market prices. Resumption of mining depended upon higher graphite prices, access to electricity from Cahora Bassa, and additional investment of about $8.5 million (International Monetary Fund, 2004a, p. 97).

Stone, Crushed.—Resources from the Muanza, Nacala, and Salamanga limestone deposits were used for cement production at the Dondo, Nacala, and Matola cement plants, respectively. In 2003, Cimpor acquired additional limestone reserves in Mozambique. Limestone production increased by 3.6% in 2003 after rising by 78.4% in 2002. Production of sand and gravel also increased rapidly as it had done in recent years (Cimentos de Portugal, SGPS, SA, 2004; p. 74).

Stone, Dimension.—In 2003, the production of granite fell to 539 cubic meters compared with 670 cubic meters in 2002; exports fell to 330 cubic meters compared with 607 cubic meters. The decrease was attributable to the unavailability of explosives in the first half of the year. The production of marble slabs rose to 10,227 square meters from 9,980 square meters in 2002. Exports of marble fell by 20% in 2003 and 75% in 2002; the decline was partially attributable to competition from South African dimension stone producers (International Monetary Fund, 2004a, p. 39; Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

Mineral Fuels

Coal.—The production of coal has been limited in recent years because damage to the Sena rail line during the civil war in the 1980s cut off access from the Moatize coalfield to overseas markets. Output was 36,742 t in 2003 compared with 43,512 t in 2002 and 8,573 t in 1999. Production fell in the first half of 2003 because of problems with aging equipment. Exports of coal fell to 15,138 t in 2003 compared with 35,770 t in 2002; the value of coal exports was $167,000 in 2003. Coal was exported to Malawi (Agencia de Informacao de Mocambique, 2003a; International Monetary Fund, 2004a, p. 38; Estevao T. Rafael Pale, National Directorate of Mines, written commun., March 15, 2004).

In November 2003, Companhia Vale do Rio Doce (CVRD) was negotiating with the Government for a 30-year mining concession in the Moatize coalfield. CVRD planned to rehabilitate mines in Moatize and the Sena rail line, which connected the mines with the port of Beira. The company was considering the export of 3 Mt/yr of coal to Brazil. The cost of the project was estimated to be $700 million. Depending on the outcome of the negotiations with the Government, production could start by the end of 2006 (Agencia de Informacao de Mocambique, 2003a).

In April 2003, Caminhos de Ferro de Moçambique (CFM) (the state-owned railway) started the rehabilitation of 90 kilometers (km) of the Sena rail line. In November, CFM issued an invitation to tender for the remaining 510 km.

Natural Gas.—Mozambique had natural gas reserves of 127 billion cubic meters, most of which were in the Pande and Temane gasfields. The new pipeline to transport gas from Pande and Temane to South Africa was completed in 2003; gas would be supplied to South Africa starting in the first quarter of 2004. Sasol Ltd. of South Africa expected to produce nearly 2.1 billion cubic meters of natural gas per year; the company indicated that it could increase production to more than 3.1 billion cubic meters without further investment. The company planned to use gas from Temane to supply its chemical plants. The cost of developing Pande and Temane was estimated to be $1.2 billion (Radler, 2003; Sasol Ltd., 2003).

Sasol engaged in further exploration at Pande and Temane in 2003. The Gas Authority of India Ltd. was negotiating an agreement with the Government for an offshore natural gas concession (Africa Energy Intelligence, 2003b; Oil & Gas Journal, 2003)

Petroleum.—Mozambique produced neither crude petroleum nor refined petroleum products and relied on imports. Petronas of Malaysia explored for petroleum in an offshore block near the Zambezi Delta that covered 29,000 square kilometers. In 2003, Petronas announced plans to spend $60 million on exploration over a period of 8 years. The company planned to drill its first deep-water well in 2004.

In July 2003, Det Norsk Oljeselskap (DNO) of Norway signed a production-sharing agreement with the Government for the Inhaminga block, which was an onshore block near the port of Beira. DNO formed a joint venture with Wilrusco of the United States to explore at Inhaminga (Africa Energy Intelligence, 2003c).

Infrastructure

Hydroelectrica de Cabora Bassa of Portugal operated the Cabora Bassa dam, which had a capacity of 2,075 megawatts (MW). In 2003, production in the electricity sector fell by 14% because of rehabilitation and modernization at Cabora Bassa that reduced the number of generators available for production. Exports to Botswana, South Africa, and Zimbabwe fell and domestic consumption increased because of economic growth and rural electrification (Agencia de Informacao de Mocambique, 2002; International Monetary Fund, 2004a, p. 41).

The Mozal smelter has increased domestic electricity demand to 1,100 MW of capacity from 200 MW. By 2015, Mozambique's demand for electricity was expected to rise to the equivalent of 3,000 MW of capacity; the Corridor Sands project would consume 155 MW of capacity in the initial phase of production before rising to 350 MW at full production. The Moma project was expected to consume 20 MW of capacity. In August 2003, the Governments of Mozambique and South Africa signed a memorandum of understanding to build a hydroelectric plant at Mepanda Uncua in Tete Province with a capacity of 2,500 MW. The plant was expected to cost $1.3 billion (Agencia de Informacao de Mocambique, 2002; Africa Energy Intelligence, 2003a; Metal Bulletin, 2003c; Mining Review Africa, 2003; Tassell, 2003).

Mozambique had about 30,400 km of roads, of which approximately 5,700 km was paved. In 2003, the Government rehabilitated 827 km of roads compared with 714 km in 2002 and 1,096 km in 2001 (International Monetary Fund, 2004a, p. 86). Mozambique's rail network covered about 3,100 km, which included the 600-km Sena rail line. The country had 865 km of natural gas pipelines, 306 km of crude petroleum pipelines, and 289 km of petroleum products pipelines; the pipeline from Beira to Harare carried petroleum products to Zimbabwe (Oil & Gas Journal, 2003). The ports and harbors were at Beira, Inhambane, Maputo, Nacala, Pemba, and Quelimane; navigable waterways covered about 3,750 km.

Outlook

The International Monetary Fund (2004c, p. 206) predicted that Mozambique's GDP would increase by 8.4% in 2004 and 6.8% in 2005. Rising aluminum and natural gas production were expected to contribute to economic growth in 2004. CFM was expected to complete the section of the Sena rail line that connected the Dondo cement plant with the Muanza limestone quarry by September 2004; cement production costs were likely to decline significantly (Agencia de Informacao de Mocambique, 2003b; Cimentos de Portugal, SGPS, SA, 2004, p. 105; International Monetary Fund, 2004a, p. 49). Cement consumption was expected to rise in 2004; the demand for other building materials, such as clays, gravel and crushed rock, limestone, and marble, could increase as well.

The outlook for titanium minerals depended heavily upon global market trends. In 2003, the market for titanium dioxide was in a state of excess supply. Demand for titanium dioxide was expected to increase by about 110,000 t/yr, and the market was likely to be in balance by 2007 (Mining Review Africa, 2003).

References Cited

Africa Energy Intelligence, 2003a, Mozambique—Agreement on Mepanda Uncua Dam: Africa Energy Intelligence, no. 352, September 3-16, p. 6.
Africa Energy Intelligence, 2003b, Mozambique—Gas rush in offshore: Africa Energy Intelligence, no. 352, September 3-16, p. 6.
Africa Energy Intelligence, 2003c, Mozambique—Norwegian newcomer signs up: Africa Energy Intelligence, no. 351, July 30-September 9, p. 5.
Africa Mining Intelligence, 2002, Mozambique—Mining industry overhaul: Africa Mining Intelligence, no. 38, May 22-June 4, p. 1.
African Eagle Resources plc, 2004, Annual report and accounts 2003: London, United Kingdom, African Eagle Resources plc, 24 p.
Agencia de Informacao de Mocambique, 2002, Mozambique will need 3,000 megawatts by 2015: Maputo, Mozambique, Agencia de Informacao de Mocambique press release, October 10, 1 p.
Agencia de Informacao de Mocambique, 2003a, Mozambique—Brazilian company wants mineral rights for 30 years: Agencia de Informacao de Mocambique press release, November 6, 1 p.
Agencia de Informacao de Mocambique, 2003b, Obstacles to rebuilding Sena line removed: Maputo, Mozambique, Agencia de Informacao de Mocambique press release, July 22, 2 p.
Cimentos de Portugal, SGPS, SA, 2001, Annual report 2000: Lisbon, Portugal, Cimentos de Portugal, SGPS, SA, 214 p.
Cimentos de Portugal, SGPS, SA, 2004, Annual report 2003: Lisbon, Portugal, Cimentos de Portugal, SGPS, SA, 209 p.
International Monetary Fund, 2004a, Republic of Mozambique—Poverty reduction strategy paper progress report (review of the economic and social plan for 2003): Washington, DC, International Monetary Fund, May 18, 121 p.
International Monetary Fund, 2004b, Republic of Mozambique—Statistical appendix: Washington, DC, International Monetary Fund, March 5, 33 p.
International Monetary Fund, 2004c, World economic outlook—The global demographic transition: Washington, DC, International Monetary Fund, September, 287 p.
Kenmare Resources plc, 2003a, Annual report 2002: Dublin, Ireland, Kenmare Resources plc, 36 p.
Kenmare Resources plc, 2003b, Kenmare announces increase in expected zircon production: Dublin, Ireland, Kenmare Resources plc press release, June 6, 1 p.
Kenmare Resources plc, 2003c, Kenmare signs further sales agreements: Dublin, Ireland, Kenmare Resources plc press release, July 31, 1 p.
Kenmare Resources plc, 2003d, Kenmare signs ilmenite and rutile sales contract: Dublin, Ireland, Kenmare Resources plc press release, July 1, 1 p.
Metal Bulletin, 2003a, Untitled: Metal Bulletin, no. 8817, November 24, p. 23.
Metal Bulletin, 2003b, Fleming's Mozambique tantalum project ramps up: Metal Bulletin, no. 8752, February 27, p. 6.
Metal Bulletin, 2003c, Mozal will lead way to downstream production: Metal Bulletin, no. 8812, October 20, p. 15.
Mining Journal, 2003, Mozal II hits full production: Mining Journal, v. 341, no. 8752, September 5, p. 176.
Mining Review Africa, 2003, Corridor Sands—An exciting opportunity for regional employment and contracts: Mining Review Africa, no. 5, p. 8-12.
Oil & Gas Journal, 2003, Quick takes: Oil & Gas Journal, v. 101, no. 34, September 8, p. 8-9.
Radler, Marilyn, 2003, Worldwide reserves grow; oil production climbs in 2003: Oil & Gas Journal, v. 101, no. 49, December 22, p. 43-47.
Sasol Ltd., 2003, Mega gas project fast approaching completion: Investor Insight, no. 1, December, p. 4.
Tassell, Arthur, 2003, Moma project ahead of the field: African Mining, v. 8, no. 5, September-October, p. 44-46.
WMC Resources Ltd., 2003, Corridor Sands: Southbank, Australia, WMC Resources Ltd., brochure, January, 9 p.
World Bank, 2003, Mozambique—Country assistance strategy: Washington, DC, World Bank, Report No. 26747-MOZ, October 20, 122 p.
World Bank, 2004, The Republic of Mozambique—First poverty reduction support credit: Washington, DC, World Bank, Report No. 29262-MZ, June 9, 107 p.

Internet Reference Cited

International Monetary Fund, 2004 (September), Selected world aggregates, World Economic Outlook Database, accessed November 17, 2004, via http://www.imf.org/external/pubs/ft/ weo/2004/02/data/index.htm.

TABLE 1

MOZAMBIQUE: PRODUCTION OF MINERAL COMMODITIES [1]

(Metric tons unless otherwise specified)

Commodity[2]		1999	2000	2001	2002	2003
Aluminum:						
Bauxite		7,883	8,130	8,592	9,119	11,793
Metal, refined		--	53,800	266,000	273,200	407,400
Beryl	kilograms	-- [e]	18,600	800	54,300	78,300
Cement, hydraulic	thousand tons	216	270	265	285 [r]	362
Clays:						
Bentonite:						
Crude		10,828	16,144	1,357	--	--
Processed		360	274	254	580	684
Brick		NA	61,884 [r]	63,125	84,024	100,176
Coal, bituminous		8,573	16,115	27,600	43,512	36,742
Gemstones:						
Aquamarine	kilograms	NA	154 [r]	47	26	35 [e]
Dumortierite		NA	60 [r]	50	40	65
Garnet	kilograms	2,396 [r]	547 [r]	--	1,136	440
Tourmaline	do.	NA	77 [r]	18	124	581
Gold[3]	do.	19	23	22	17	63
Graphite, concentrates		4,007	--	--	--	--
Natural gas	thousand cubic meters	900 [r, e]	912 [r]	1,225 [r]	2,423 [r]	2,522
Quartz	kilograms	NA	NA	24,765	31,363	41,000 [e]
Salt, marine[e]		82,000	7,000	10,000	80,000 [r]	80,000
Sands	cubic meters	NA	299,540 [r]	464,684	795,813	1,372,032
Stone:						
Granite	do.	NA	796 [r]	662	670	539
Gravel and crushed rock	do.	368,554 [r]	602,141 [r]	503,716 [r]	795,733 [r]	1,050,000 [e]
Limestone		NA	585,590 [r]	729,230	1,301,232	1,348,372
Marble:						
Block	cubic meters	1,256 [r]	454 [r]	320	453	452
Slab	square meters	16,296 [r]	14,640 [r]	15,303	9,980	10,227
Tantalite	kilograms	-- [e]	25,000 [r]	27,000	46,900	188,695

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. NA Not available. -- Zero.

[1]Data available through June 30, 2004.

[2]In addition to the commodities listed, construction materials (other clays, sand and gravel, and stone) and tantalum were produced. However, output is not reported quantitatively, and information was insufficient to make reliable estimates.

[3]Does not include unreported production; total output of gold was estimated to be roughly 360 to 480 kilograms per year.

TABLE 2
MOZAMBIQUE: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Aluminum		Mozal SARL (BHP Billiton plc, 47.11%; Mitsubishi Corporation, 25%; Industrial Development Corporation, 24.04%; Government, 3.85%)	Maputo	506,000
Bauxite		E.C. Meikles (Pty) Ltd. of Zimbabwe	Monte Snuta	12,000[e]
Bentonite[1]		Cia Desenvolvimento Mineira	Boane	NA
Cement		Cimentos de Mocambique, SARL (Cimentos de Portugal, SGPS, SA, 51%)	Dondo, Matola, and Nacala	760,000
Coal, bituminous		Carbomoc	Moatize	60,000
Graphite		Kenmare Resources plc[2]	Ancuabe	10,000
Marble, block	cubic meters	Marmonte E.E.	Montepuez	1,500
Natural gas	million cubic meters	Sasol Ltd. (50%); iGas Pty. Ltd. (25%); Empresa Nacional de Hidrocarbonetos de Moçambique (25%).	Temane	3,100
Tantalite	kilograms	Fleming Family & Partners	Marropino	90,000[e]
Do.	do.	Hegemony Resources	Naquissupa	NA

NA Not available.
[1]Shut down in 2001.
[2]On care and maintenance since 1999.

TABLE 3

MOZAMBIQUE: MINERAL RESOURCES IN 2003 [1]

Commodity	Deposit	Tonnage	Grade	Mineral content
Bentonite	Boane	7.1 Mt	NA	NA.
Beryllium	Monea, Morrua, and Muiane	NA	NA	3,100 t BeO
Coal	Moatize	7,200 Mt	NA	NA.
Do.	Minjova	7,100 Mt	NA	NA.
Do.	Mucanha-Vuzi	3,600 Mt	NA	NA.
Do.	Maniamba	230 Mt	NA	NA.
Columbium (niobium) and tantalum	Marropino	22 Mt	108 g/t Nb_2O_5; 254 g/t Ta_2O_5	2,400 t Nb_2O_5; 5,500 t Ta_2O_5.
Do.	Morrua	7.5 Mt	88 g/t Nb_2O_5; 661 g/t Ta_2O_5	660 t Nb_2O_5; 5,000 t Ta_2O_5.
Gold:				
Placer	Chimezi, Inhamurra, Muza, and Revue Rivers	110 million cubic meters	0.25 g/m^3	25 t Au.
Lode	Chimezi, Chua, Mangota, and Penhalonga/Revue	3.5 Mt	6.7 g/t Au	22 t Au.
Graphite	Cabo Delgado Province	33 Mt	15% graphite	4.9 Mt graphite.
Do.	Satemua	5.6 Mt	6.3% graphite	340,000 t graphite.
Natural gas	Pande and Temane	130 billion cubic meters	NA	NA.
Titanium and zirconium	Corridor Sands:			
Do.	West Block	1,800 Mt	4.14% ilmenite; 0.02% rutile; 0.15% zircon	73 Mt ilmenite; 350,000 t rutile; 2.6 Mt zircon.
Do.	East Block	910 Mt	3.8% ilmenite	34.5 Mt ilmenite.
Do.	Other areas	14,000 Mt	NA	NA.
Do.	Moma	2,100 Mt	3% ilmenite; 0.08% rutile; 0.18% zircon	63 Mt ilmenite; 1.8 Mt rutile; 3.9 Mt zircon.

NA Not available.

[1]Abbreviations used in this table for commodities include the following: Au--gold; BeO--beryllium oxide; Nb_2O_5--columbium (niobium) oxide; and Ta_2O_5--tantalum oxide. Abbreviations used in this table for units of measurement include the following: Mt--million metric tons; t--metric tons; m^3--cubic meters.

Sources: Afonso, R.S., and Marques, J.M., 1998, Recursos minerais da Republica de Mocambique [Mineral resources of the Republic of Mozambique]: Maputo, Mozambique, Direccao Nacionalde Geologica, 150 p.

Kenmare Resources plc, 2003a, Annual report—2002: Dublin, Ireland, Kenmare Resources plc, 36 p.

Radler, Marilyn, 2003, Worldwide reserves grow; oil production climbs in 2003: Oil & Gas Journal, v. 101, no. 49, December 22, p. 43-47.

Ruffini, Antonio, 1998a, Mozambican focus on heavy minerals, coal: African Mining, v. 3, no. 1, January-February, p. 45-46, 52.

Ruffini, Antonio, 1998, Rehabilitating Mozambique's coal sector: African Mining, v. 3, no. 1, January-February, p. 47-48.

WMC Resources Ltd., 2003, Corridor Sands: Southbank, Australia, WMC Resources Ltd., brochure, January, 9 p.